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Hospital centralization and performance in Denmark—Ten years on[☆]

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ABSTRACT

Denmark implemented a major reform of the administrative and political structure in 2007 when the previous 13 counties were merged into five new regions and the number of municipalities was reduced from 271 to 98. A main objective was to create administrative units that were large enough to support a hospital structure with few acute hospitals in each region and to centralize specialized care in fewer hospitals. This paper analyses the reorganization of the somatic hospital sector in Denmark since 2007, discusses the mechanisms behind the changes and analyses hospital performance after the reform. The reform focused on improving acute services and quality of care. The number of acute hospitals was reduced from about 40–21 hospitals with new joint acute facilities, which include emergency care wards. The restructuring and geographical placement of acute hospitals took place in a democratic process subject to central guidelines and requirements. Since the reform, hospital productivity has increased by more than 2 per cent per year and costs have been stable. Overall, indicators point to a successful reform. However, it has also been criticized that some people in remote areas feel “left behind” in the economic development and that hospital staff are under increased workload pressure. Concurrent with the centralization of hospitals municipalities strengthened their health service with an emphasis on prevention and health promotion.

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1. Background and aim

Denmark implemented a major reform of the administrative and political structure in 2007 [1,2,3,32,41]. At that time, the country had three administrative levels – the state, county and municipal – each with the authority to levy taxes. The background for the reform was that the administrative structure was seen as being composed of too many small units at both the municipal and county levels to be able to provide services of a satisfactory quality. In particular, it was a cause for concern that hospitals with a small volume of surgical patients were not able to provide surgery of a high quality due to limited surgeon experience [35]. Moreover, having larger municipal units would allow for a decentralization of tasks from the state or the regions. Bigger units were seen as a condition for better prioritization and coordination of activities in the public sector. Some stakeholders found that three administrative levels with the authority to levy taxes in a small country of just 5.6 million

inhabitants were too many, and cost savings could be achieved by reducing the number of levels to two [1,2,32].

In brief, the aim of the reform related to health care was threefold: 1) to create larger administrative units at the second level (former county level), which would allow the creation of larger hospital units and were expected to increase the quality of treatments. Likewise, an increase in size would allow municipalities to take responsibility for more tasks related to health; 2) to increase efficiency through administrative rationalization; and 3) to strengthen the governance of health care, including governmental regulation of the health care sector. More specific aims for the health care sector were formulated by the National Board of Health (NBoH), including the central planning of specialties (hospital service planning), improved acute services with joint acute facilities, increased local prevention and health promotion as well as a nationwide electronic patient record system [2]. The principle of easy and equal access for everyone was maintained as a fundamental value.

The reform merged the previous 13 counties (and three municipalities with county functions) into five new regions rather than abolishing the second administrative level, and it reduced the number of municipalities from 271 to 98. The reform also changed the responsibility and financing of health care, and the authority of the national level to regulate the health care sector through the NBoH was strengthened [15] (Box 1).

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Box 1: Hospitals.

The hospital sector in Denmark is predominantly public. Following a structural reform in 2007, each of the five regional governments owns and operates the public hospitals within its region besides contracting with general practitioners and other health providers outside hospitals. One hospital in each region serves as a university hospital. Having ownership allows the regions to operate their hospitals in a coordinated fashion with respect to specialization and geographical placement as well as relations to providers outside hospitals, such as general practitioners. A substantial share of hospital care is delivered as outpatient care within the hospitals. Hospitals are financed through a mix of global budgets and case-based payments based upon a DRG system (grouping of patients into diagnosis related groups).

While the policy process behind the Structural Reform has been analysed elsewhere [32,1,2], there are important outstanding questions about the implementation and outcomes of the reform. The aims of this paper are to analyse the reorganization of the somatic hospital sector in Denmark since 2007, to present evidence about the performance of hospitals after the reform and to discuss the mechanisms behind the changes. This is highly relevant, as many European countries are considering centralization reforms as a way to improve the efficiency of hospital services.

It is well known that top-down reforms may be stifled or have unexpected consequences at the decentral levels. Institutional theory points to path dependency, incrementalism and “status quo bias” [4]. This is based on risk aversion, uncertainty [4] and the pervasiveness of norms and routines tied to the existing structures [5]. Vested interests and formalized interest group representation can further bias the political economy against radical changes [6]. Furthermore, general ambitions can be stifled in the implementation phase if the choice of instruments is inappropriate, or there is a lack of will or ability to follow through on central decisions [7,8].

In our case, we investigate whether the potential barriers against hospital reorganizations have indeed affected the outcome of the reform. We argue that the end result depends on how the reform and the following processes affected the political economy for regional decision-makers and whether reorganizations are backed by sufficient political pressure and convincing narratives [6].

2. Methods

Our investigation is based on descriptive statistics, publicly available documents and the scattered evaluations of reform aspects that have been published so far. While there have been concurrent health policy changes over the past decade, the Structural Reform provided the institutional infrastructure for such subsequent changes. It is therefore reasonable to argue that mergers and reorganizations and, more indirectly, the performance of Danish hospitals can be related to the Structural Reform and the institutional governance conditions created by the reform.

An independent, comprehensive evaluation of the Structural Reform has never been conducted due to the complexity of the reform (covering all parts of the welfare state) and the many simultaneous changes. The government concluded in a report in 2013 [42] that the reform was generally a success. However, further efforts were needed with regard to financing models to support integrated care (revision of the municipal co-financing), health agreements and follow-up with general practitioners, integrated IT systems, prevention (municipalities), rehabilitation (municipalities) and psychiatry.

The rest of the paper is structured as follows: First we look at instruments and processes of the reform, stakeholders, evidence for

reform decisions and the role of the municipalities after the reform. We then present detailed information about developments after the reform with regards to: hospital investments, reorganization of acute care, financing and hospital payment schemes, digitalization and quality control. Finally we present evidence about the performance of the Danish hospitals after the reform. We discuss the political and institutional conditions that facilitated the reorganization of hospitals in Denmark before we present the overall conclusion.

3. Results

3.1. Instruments and processes

With the administrative structure in place an important task at the regional level was to redesign hospital structure and functions. The reform increased the power of the NBoH and centralized the economic power to the national level. This meant that the pursuit of the general aims of the reform became strongly influenced by national authorities. While the NBoH issued general guidelines with respect to specialty planning, an important task for the democratically elected politicians in each regional board was to initiate local specialty planning to comply with national guidelines. The specialty planning by the NBoH included a definition of which specialties should be present at the regional level, and which should be available at a smaller number of hospitals to serve patients across regions. In this process it was decided which specialties should be present in regions at which hospitals, which hospital were to have changed functions and which should be closed. Compliance with the guidelines was a prerequisite to receive funding for the renewal of hospitals, and this gave the regions an incentive to comply. The process took place over several years and involved negotiations between each region and the NBoH before a final plan was issued by the NBoH. The clinical community was involved in the process by participating in a dialogue with each region and also at the national level by guiding the NBoH with respect to what was feasible for a country like Denmark [35: 123]. Although it was a difficult process to change the hospital infrastructure, the OECD notes that “there was a remarkable level of consensus and goodwill surrounding these efforts in Denmark” and suggests that this may reflect the fact that the “regions found themselves uniquely responsible for health and more financially dependent on the centre” [35: 120–121].

3.2. Stakeholders

The hospital reform was part of a larger administrative reform that influenced all parts of the public sector. Main stakeholders in the process of re-organizing hospitals were politicians and policy makers, public authorities like the NBoH, Danish Regions (the national association of regions), Local Government Denmark (the national association of municipalities), health care professionals, hospital managers, patient associations and the population at large. The role of some of the stakeholders changed in connection with the reform: The NBoH got a stronger role in shaping the hospital landscape, while the power of the regions was reduced as they were left without authority to levy taxes and with less room for prioritizing compared to the situation of the former counties which could prioritize between health care and other public services.

3.3. Evidence and information

The evidence in the international literature about the size of specialized hospitals was mixed [35]. However, some guidance could be found by using registers of routinely collected hospital data on volume and quality, and such data, besides assessments by clinical experts, were used by the NBoH to formulate guidelines. Changing

Box 2: National Board of Health.

In 2016 National Board of Health (NBoH) changed its name to the Danish Health Authority (DHA). It is the supreme health professional authority in Denmark. The authority is placed directly under the Ministry of Health, and its main tasks include overall activities related to health promotion, prevention and treatment of diseases. It has a central role in specialty planning which involves planning of the hospital sector and division of tasks among various types of hospitals and their level of specialization. A distinction is made between basic hospital functions and highly specialized functions. The authority specifies the requirements for highly specialized functions and has the authority to approve the placement of highly specialized functions at hospitals in the regions. The term NBoH will be used throughout the paper.

Box 3: Health centres.

Municipalities can establish health centres which can provide health services by various providers. These centres vary with respect to structure and functions, but the main purpose is to provide routine health services to citizens. Medical doctors are normally not attached. The centres can focus on patients with chronic conditions which require frequent control, marginalized groups, rehabilitation, prevention and health promotion.

perceptions about localism and benefit of scale were behind the general Structural Reform [1] and were also present in the debates about hospital infrastructure. The government used expert committees to establish criteria for the optimal catchment areas and to review regional plans [11,12] (Box 2).

3.4. The role of the municipalities

Compared to the former counties, the new regions' area of responsibility was narrowed to, in particular, planning and operating hospitals as well as contracting with providers practising in private clinics outside hospitals, such as GPs, dentists, physiotherapists and medical specialists. The enlarged municipalities took over the responsibility for health care in the community from the counties, but with increased emphasis on health promotion, primary prevention, rehabilitation and care for patients with chronic conditions. Mandatory agreements between regions and municipalities were introduced to enhance coordination with regard to admissions, discharge, rehabilitation and capacity.

3.5. Changes to the hospital structure after the reform

Following the reform, the hospital structure changed from consisting of 40 public hospitals in 82 locations in 2007 to having 21 hospitals in 68 locations in 2016 [11]. Twenty-one of these are acute hospitals, while others treat elective patients. Some hospitals were closed, others were transformed into health centres run by the local municipalities (Box 3).

Hospital treatment in Denmark can take place at two levels, either the general or the specialized level. Specialized treatment is defined as either a regional treatment function or a highly specialized treatment function. The NBoH has defined 36 specialties [38]. Treatment at the general level comprises 90 per cent of all treatments. Examples are general medicine and uncomplicated surgery. A regional function is typically placed at 1–3 locations in a region, and collaboration among the units is required. Examples are various types of diagnostic scanning, radiation therapy and vascular surgery. Treatment at the highly specialized level is typically placed

at 1–3 locations in the country. Hence, specialized treatment has been centralized at a few hospitals, in some cases only one hospital. Examples are surgery for lung cancer, heart surgery, transplants or treatment of serious burns. When deciding the level of care, the NBoH uses a number of criteria, such as the capacity of clinical services, patient volume, experience and expertise, access to required technical facilities, documented clinical quality and others [35: 123]. Adjustments are made annually by the NBoH [55]. Hospitals that carry out specialised functions also treat less complicated cases. In summary, there has been a centralization of hospital activities, both within regions and nationwide, with respect to highly specialized care, which is primarily guided by quality requirements.

It has been recommended that efforts are made to increase a pathway oriented hospital structure which allows an interdisciplinary collaboration in treatment and care due to an increased share of patients with chronic conditions [12]. The establishment of new joint acute wards (see below) is an example of a pathway-oriented structure.

3.6. Urgent and emergency care

According to the recommendations of the NBoH [11], all urgent contacts to hospitals (except emergencies) must be based on telephone guidance and referral from a call centre. The call centre can either give guidance over the telephone or refer the patient to an urgent care clinic run by GPs or to an urgent and emergency hospital facility (joint acute facility or emergency clinic, see Box 4). This procedure was implemented in all regions in 2014 and is either carried out by a nurse or a general practitioner who receives the calls from acute patients [9]. The system is meant to ensure that patients are treated at the lowest effective cost level. The system has not been evaluated, but some doctors have been strongly opposed to placing nurses in the front line at the acute telephone. The result has been that nurses carry out this function in one region while other regions use GPs.

One of the key ideas in the reform was to abandon the previous dispersed emergency and urgent care units and, instead, to establish urgent care in fewer hospitals with so-called “joint acute facilities” which have a broad spectrum of specialized clinical competences and specialized equipment at their disposal. In principle, this allows patients to be treated by specialists at an early stage of their contact with a hospital and facilitates better coordination of diagnostics and care for patients with multiple health problems. In addition to higher quality this is also expected to save resources [9]. According to the guidelines issued by the NBoH, an acute hospital should cover an area with between 200,000 and 400,000 citizens, depending on population density, to ensure a sufficient volume.

Acute patients made up 72 per cent of all hospital admissions in 2015. At present, 17 acute hospitals out of 21 have created a joint acute facility in one physical location [9]. In spite of resistance from some parts of the medical profession [10], a specialty in emergency care was approved by the NBoH in 2017 [38].

Concurrent with the restructuring of the acute hospital service, pre-hospital services were improved significantly by the introduction of acute care ambulances with improved equipment as well as vehicles with emergency care doctors to assist the ambulance crews. Emergency care helicopters cover the five regions 24 h a day and are placed at three different locations [17]. Each region has taken measures to secure coherence between the emergency pre-hospital services and the emergency reception. One tool is an electronic Pre-Hospital Patient Record, which can monitor patients while they are in the ambulance and send information directly to the receiving hospital, so that the patient can be stabilized and the hospital staff is prepared when the ambulance arrives [18]. To handle minor problems some regions have established local urgent care clinics.

Box 4: Joint acute facilities.

A joint acute facility is a hospital ward that receives acute patients suffering from all kinds of health problems. The facilities include former emergency wards. That means that there is only one entrance to acute health care irrespective of diagnosis. It is required that a number of specialists from the most common areas of specialty are present at the facility or present at the hospital and can be called upon when needed all hours. The purpose of this structure is to increase effectiveness in diagnostics and treatment and discharge patients without unnecessary delay. Patients whose care takes more than 48 h will be transferred to a specialized hospital department [11,23,34]. Besides the acute facility, some acute hospitals also run trauma centres for serious traumas, and general practitioners run out-of-hours' service, typically on the premises of a hospital.

It has been estimated that about 12 per cent of the population will have more than 30 km to the nearest acute hospital in 2020 [37]. Some of these live on islands and have a long travel time to the nearest hospital by ordinary means of transportation, but if the emergency is life threatening the emergency helicopter service can be used (Box 4).

3.7. Hospital investment

Following the reform, a major government investment scheme was launched. The government has set aside an extra 25 billion DKK for investment in a new hospital structure on top of ordinary investment grants for the period 2009–2018. In addition, regions can finance investments for 15 billion DKK from their own budgets [12].

New hospitals are currently under construction in all five regions in addition to comprehensive projects to renew or enlarge existing hospitals. The renewal or creation of new hospitals reflects the plan to gather specialties in fewer hospitals and to establish joint acute wards, which means that fewer patients will be admitted to specialized wards before being discharged. In general, the hospitals under construction will have a smaller numbers of beds compared to the ones they substitute, as the effectiveness of treatments as well as the municipal services are expected to improve, thereby allowing earlier discharge and preventing “unnecessary” admissions to hospital. The Government's Expert Panel [12] estimated an increase of 50 per cent in the number of ambulatory visits and, corresponding to this, a decrease of about 20 per cent in the demand for beds based on previous trends and estimates with respect to the need for treatments, capacity utilization and standards for space. In their estimates, the panel was cautious not to overstate the need due to the economic implications. A structure with 25–30 per cent single-bed wards was planned [12]. However, the estimates by the panel have later turned out to overstate the need for beds [13]. At the same time, budgets have apparently been too optimistic, as the costs of many projects have increased and some construction plans have had to be amended by reduction in facilities, space or quality. Critics have also faulted the fact that the construction takes place in all regions at the same time rather than stepwise, which would reduce the demand for scarce construction resources, limit price increases and allow for a learning process [14].

3.8. Financing regional health care

Regional health care is financed by a mix of government grants (about 81 per cent), municipal co-payment (about 18 per cent of the total health care budget) and activity based funding (about 1

per cent) to reward extra activity. The total government grants are negotiated between the government and Danish Regions before approval in Parliament and being included in the Fiscal Act. The grant is then allocated to each region on the basis of a formula which includes objective criteria (demography and socio-economic characteristics) which cannot be influenced by the regions.

The government has demanded a productivity increase of 2 per cent per year (extra production with an unchanged budget) by the hospitals as measured at the regional level. This instrument was in place in 2003 (before the reform) and has been maintained, but was raised from 1.5 to 2 per cent in 2006 [35]. Marginal increases of budgets have been motivated by specific initiatives like, for example, intensified cancer treatment (the so-called “Cancer package”), heart treatment (the “Heart package”) or extra costs due to expensive new hospital medicine.

Municipal co-payment for treatment of their own citizens was introduced in 2007 as part of the administrative reform. The purpose was to incentivize municipalities to enhance prevention and health promotion. The payment model will be changed in 2018 to include age differentiation, where the highest payments are associated with the usage of health care by the age groups that the municipalities are expected to influence most easily (0–2, 65–79 and 80+ years) [19]. When the new structure was established, most municipalities needed to build their own capacity to handle tasks related to prevention, rehabilitation and health promotion. These tasks had previously been placed in the counties. However, the extent of activities had to be increased in accordance with the reform when the municipalities agreed to take responsibility for these tasks. Their role with respect to care of patients after discharge from hospitals was unchanged, and the shortening of hospital stays and ensuring increased need for care in the home or home municipality had taken place over a long period.

Treatments which are carried out in another region than the patients' home region, are paid for by the home region on the basis of official DRG fees (fees based on diagnosis related groups) which are updated and published annually by the NBoH.

3.9. Paying hospitals

Regions have been required to finance their hospitals partly on the basis of activity measured in terms of DRGs (diagnosis related groups) since before the reform. The rest is paid by global budgets. A national recommendation of a 50–50 per cent split between these payment modes was introduced in 2008 following the reform. In practice, the requirement of a 2 per cent productivity increase has been applied to each hospital and to each hospital department, irrespective of their circumstances, and it has implied a productivity increase of about 30 per cent during the period 2003–2017. This system has an inbuilt economic incentive to increase the number of procedures and thereby increase the DRG payments without necessarily increasing quality and the health of the patients. Therefore, some experimentation with other outcome measures related to quality as defined by each department has been initiated [20], and Danish Regions and the government have agreed to analyse other forms of hospital governance [36], in particular with inclusion of quality measures in the allocation formulas. Capital investments are negotiated separately between the government and Danish Regions.

Apart from municipal co-payment and the removal of regional politicians' authority to balance taxation and service level, no specific financial instruments to steer the reform were introduced. However, there has been a general tendency to increase government control of both activities and economy as exemplified by the “Budget law” from 2014, which introduced automatic sanctions if municipalities and regions spend above their budgets (see below).

3.10. Quality assurance

Quality assurance has been part of the Danish health care system for a number of years. It was initiated by the NBoH in collaboration with clinical specialty societies before the reform [43]. Danish hospitals were accredited according to a strategy for quality development in the hospital sector until the end of 2015 using criteria from a Danish Quality Model (DKKM) [43]. The accreditation was terminated due to – among others – administrative costs that were perceived too high compared to the outcome [47]. A new programme focusing on a smaller number of national goals combined with locally defined specific goals was launched by the Ministry of Health in 2015 [46]. The national goals include increased value for patients (i.e., better health and increased quality as experienced by the patients) and lower costs per treated citizen. The programme presupposes a new approach to quality assurance, and the emphasis has changed from process to health improvements; inclusion of the preferences of patients; increased use of data on quality, activity and costs; and improved management and leadership. Finally, the programme recommended the use of financial incentives to support quality, in contrast to the predominant focus on activity as implied by the traditional regional payment of hospitals.

The new quality indicators will be integrated into the electronic publishing system, which has existed in different forms since the early 1990s. A website can be accessed at www.esundhed.dk [48]. This website also links to publications of patient satisfaction data (LUP) [45]. Danish Regions already tracks and publishes developments according to the new indicators [49, 57].

More than 60 nationwide clinical databases have been endorsed by the NBoH and are maintained by each specialty in addition to a recurrent nationwide survey of patient satisfaction [45]. In follow-up to the planning of specialties, the NBoH monitors each specialty on the basis of registers [44]. The regions have initiated a strategy to get feedback from citizens based on their preferences [46].

3.11. Electronic patient records

Electronic patient records (EPR) were gradually developed before 2000 by local initiatives. These initiatives created “IT islands” of systems that did not communicate (well) together. However, in spite of government strategies, the development was slow, which gave rise to criticism by the National Audit Office [53]. The government formulated a new electronic strategy in 2007 [51] and renewed it in 2013 [50]. The strategy included the development of the EPR, which is defined as a clinical information system that supports the whole process of diagnostics, treatment and care for a patient. It includes modules with basic patient information, notes, prescription of medicine, appointment and requests for tests or examinations and their results. The EPR system has been almost fully implemented at Danish hospitals in 2017, and the systems have been harmonized within each region [53]. With the EPR in place the staffs in a regional health care sector and the municipalities therein have easy access to updated information of relevance for diagnostics, treatment or care for a given patient. The system also allows patient information from hospitals to be sent to the patient’s own GP. The communication between systems across regions still needs improvement, which is of importance when a patient is treated in another region than his or her home region.

Citizens have easy access to all kinds of health information at the internet portal www.sundhed.dk [48]. They can also get access to their own health data and to messages using a personal identification system with PIN codes. A joint medical record [52], which is one of the modules of the EPR, includes information on medications. Pharmacies use the facility when receiving electronic prescriptions and delivering medicine to patients. Booking of ambulatory visits can also be made by patients. Finally, the use of telemedicine for

patients with chronic conditions is increasing. It allows patients to be monitored while staying in their home rather than paying ambulatory visits.

An important advantage of using EPR is that it is fast and reduces the risk of errors that used to occur in connection with paper records. Access is regulated by law and staff members are only authorized to read information from the patients they treat [54].

3.12. Activity and performance

Fig. 1 shows the development of selected key indicators related to health care during 2007–2015. Hospital productivity has increased substantially, although the actual increases have been uneven over the years with an average increase of 3 per cent between 2011 and 2015 [55]. The sickness absence of staff members and waiting times for planned surgery have decreased (except in 2008 when there was a strike among nurses). Life expectancy has been relatively low in Denmark mostly due to a risky life style (high consumption of tobacco and alcohol), but during the period 2006–2007 to 2015–2016 it increased by 2.9 years to 78.8 years for men and by 2.3 years to 82.8 for women [39]. Heart mortality as one outcome indicator has decreased by 1/3.

Total health care expenditure (including private payment) as a share of GDP increased from 9.3 to 10.6 per cent during 2007–2015. Total regional health care expenditure in 2014 was equal to 21.0 billion USD (74 per cent of total public health care expenditures). Of these, hospitals accounted for 75.1 per cent [40].

Since the establishment of the regions, budgets have gradually become subject to stronger control. A Budget Act in force since 2014 has introduced specific budget ceilings in the public sector for the subsequent years. The result of such hard budget constraints has been that total regional and municipal operating expenses per citizen have been stable in fixed prices since 2009 [22].

Administrative costs for hospitals have been stable at about 5 per cent over the period, which may be ascribed to the single-payer system making the handling of payment easier as well as centralization of some common functions. Danish health care expenditure as a share of GDP is slightly below the average of 21 “old” OECD countries when (long term) care in the municipal sector is omitted (8.4 per cent for Denmark compared to 8.7 per cent for OECD countries) [21]. Part of this may be ascribed to the new structure, while another part may be attributed to an ongoing trend towards applying public management tools to promote frugality at all levels.

Table 1 shows the changes from 2007 to 2015 inpatient admissions, visits and procedures. It testifies to changes in the hospital structure and the mode of treatment with increased activity, especially in ambulatory care, shorter waiting times and shorter length of stay.

The number of geographical hospital locations as well as acute hospital facilities has decreased substantially. Most of these locations were previously run jointly with another hospital. After closure some of these facilities have been transformed into health clinics.

The composition of staff in somatic and psychiatric hospitals changed between 2007 and 2015 [24]. While total full time employment increased by 10 per cent, the number of hospital doctors increased by 19 per cent (consultants by 26 per cent), nurses by 13 per cent and other professional health care staff by 19 per cent, while the number of social and health care assistants was reduced by 17 per cent. This reflects the increased specialization of hospital organizations. In spite of the increase in professional staff there is growing criticism about high workload and stress particularly among nursing staff [29].

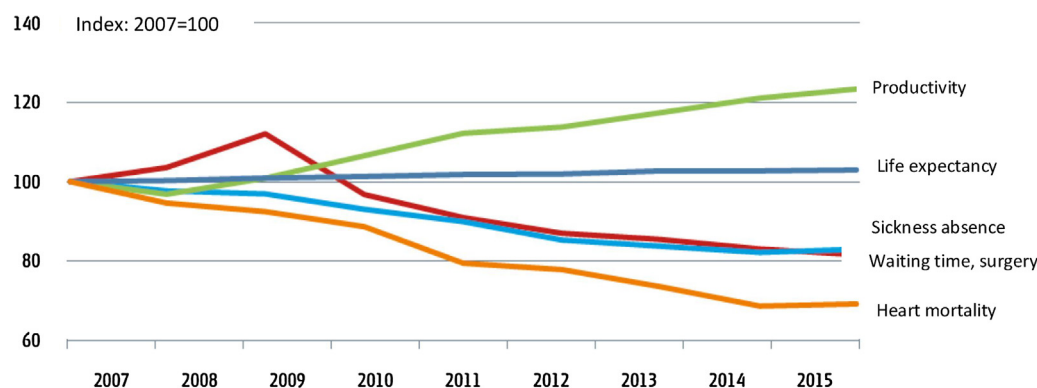


Fig. 1. Indices of development in hospital productivity, life expectancy, sickness absence and waiting time for surgery 2007–2015. Note: Sickness Absence is absence by employed in regions and municipalities. Life expectancy is for the whole population.

Source: [21].

Table 1

Key indicators of development of regional hospital structure and performance. 2007–2015 (or nearest year).

	2007	2015
<i>Employment, full time equivalent, somatic and psychiatric</i>		
Doctors	13,109	15,632
Nurses	31,472	35,622
Other health care personnel	11,332	13,501
Social and health care assistants	11,725	9762
Total employed, full time equivalents	67,637	74,516
Prescribed number of beds, somatic	15,835	13,299 (2)
Number of admitted somatic patients, 1000	673	677
<i>Outpatient visits, somatic</i>		
Number of ambulatory patients, 1000	2407	2654
Number of ambulatory visits, 1000	10,035	13,278
Productivity index, all public hospitals ^a	100	117 (3)
Length of stay, days	3.9	3.1 (1)
Day surgery, pct. of eligible actually performed	72 (2)	77 (5)
Number of surgery patients, 1000	508 (6)	556 (5)
Waiting times for planned surgery, days	66 (4)	47

Sources: [21,23,11,24,25,26,27,28].

Notes:.

(1) Year 2011; (2) Year 2014; (3) Until year 2014; (4) Year 2009; (5) Year 2012; (6) Year 2008.

^a Including a decrease in 2007–2008 of 3.2 per cent due to a strike in 2008. Productivity increased by 16 per cent 2009–2013.

4. Discussion

4.1. What were the political and institutional conditions that facilitated the reorganization of hospitals in Denmark?

The Structural Reform changed the balance of power in the multilevel governance relationship between the regions and the government. The regions were presented as a potentially temporary solution and have been forced to constantly prove themselves by delivering decisions that conform to the policy signals from the national level [1,32]. Centralization of tax funding for health care and increased powers to the NBoH further underlined the shift in power.

The importance of changes in the political-institutional landscape is clear in the process of developing new hospital plans in the regions. The new hospital structures were decided by the regional boards in a political process according to central guidelines and were subject to approval at the national level. For many people, the closure of local hospitals meant that they now had a longer distance to acute hospital services. This generated a heated public debate and protests in some areas before the final decisions were made. The protests had their origin in concerns about access to emer-

gency care, loss of jobs and a more general sentiment in parts of the population outside the large towns of being “left behind” by the economic development. In some cases the NBoH used its power to overrule a regional decision due to in-optimal population size [55]. In most other cases the regions made significant efforts to comply with national guidelines to avoid national intervention. This can partly be explained by pressure from key government officials stating that the legitimacy and long term survival of the regions were linked to their ability to deliver decisions in spite of protests from key stakeholder groups within the regions.

A complementary explanation is that the political landscape within the regions changed with the reform. Larger regions meant that voter constituencies changed. This made it easier for regional politicians to balance the resistance in areas where hospitals were closed with the support in areas where new hospital buildings were placed. Furthermore, in many cases the regional politicians sweetened the bitterness of having to close down local hospitals by converting them into other types of health facilities.

The political-institutional changes are supported by changes in rhetoric and shared understandings. Changing perceptions about localism and benefits of scale were behind the general Structural Reform [1] and can also be seen in the debate about hospital infrastructure. The government used expert committees to establish criteria for the optimal catchment areas and to review regional plans [11,12]. Proponents of centralization pointed to the wave of mergers in the private sector and to suboptimal performance in some smaller hospitals. Interest groups among health care professionals and patients tended to accept the idea of quality benefits of scale, and the official position of the Doctor's Association was to support the centralization. Although there were fierce protests in some local communities, the population in general accepted the rhetoric about gaining quality by sacrificing proximity, probably because the media gave examples of quality flaws at low-volume hospitals and because media also reported that individuals would prefer the best treatment in serious cases, irrespective of distance. The principle was accepted in a political agreement between the government and Danish Regions in 2006.

5. Conclusion

In this paper we have investigated the question of whether the implementation of the Structural Reform in 2007 led to a reorganization of the hospital structure in Denmark. Secondly, we asked how the reform has affected the performance of hospitals. Finally, we discussed how the reform facilitated decision-making to reorganize the hospital sector in spite of resistance from stakeholders among citizens local communities.

We conclude that significant reorganizations have taken place since 2007. The number of acute hospitals has been reduced from about 40–21, and emergency care services are being dramatically re-organized into fewer centralized “joint acute care facilities” with specialist doctors in the front line. Medical specialties have been centralized at fewer hospitals to achieve an increase in quality. At the same time, a major government investment scheme has been launched. New hospitals are currently under construction in all five regions in addition to comprehensive projects to renew or enlarge existing hospitals.

The performance trends after the reform are positive. Activity levels continue to increase, and the system has shown remarkable results in terms of ongoing productivity increases, although actual increases have been uneven over the years with an average increase of 3 per cent between 2011 and 2015 [56]. This is facilitated through ongoing national demands for productivity increases, partially activity-based payments of hospitals and tight budgets, while quality is promoted through a number of quality assurance programmes [33]. Waiting time trends are stable and quality data generally show improvements. Our observations of generally positive outcomes of the reform corroborate the conclusions in a partial evaluation conducted by the government in 2013. However, this report also pointed to weaknesses with regard to: financing models to support integrated care (revision of the municipal co-financing), health agreements and follow-up with general practitioners, integrated IT systems, prevention (municipalities) and rehabilitation (municipalities), psychiatry. Several of these issues have subsequently been addressed as discussed above. Others are still outstanding. No comprehensive independent evaluations of the reform have been made.

From an international perspective, it is remarkable that the Danish regions were able to make democratic decisions about the centralization and reorganization of the hospital structure after the reform. This can be attributed to the role of the reform as a catalyst for unfreezing the existing structure. The institutional changes introduced by the reform shifted the balance of power and changed the political economy for the regions and their politicians within the multilevel governance system. This facilitated the centralization of the hospital structure in spite of sometimes fierce local resistance. The reforms were further supported by changes in rhetoric and shared understandings about centralization and quality.

Potential lessons for other countries are that reform efforts should carefully consider the political economy for the key stakeholders and implementing agencies. Deliberate changes in the balance of power between central and decentralized authorities can facilitate implementation. In the Danish case this was accomplished by the centralization of financing, stronger power to the National Board of Health and by the persistent pressure applied by national level through threats of further structural reforms. The economic incentives related to the government investment scheme have also contributed to the regional reforms of their hospital structure.

The continuous requirement of 2 per cent increase in productivity is currently being challenged, and an ongoing discussion concerns how to incorporate quality measures in measuring hospital performance. While the regions have focused on hospitals during the last decade, it is also necessary to further develop and renew primary care and the collaboration among hospitals, specialists, general practitioners and municipalities.

References

- [1] Bundgaard U, Vrangbæk K. Reform by coincidence? Explaining the policy process of structural reform in Denmark. *Scand. Polit. Stud* 2007;30(4):491–520.
- [2] Christiansen T. Ten years of structural reforms in Danish healthcare. *Health Policy* 2012;106:114–9.
- [3] Indenrigs- og Sundhedsministeriet [Ministry of Interior and Health]. Kommunalreformen – kort fortalt [The Municipal reform – in brief]. Copenhagen: 2005. <http://joim.dk/media/93091/kommunalreformen-kort-fortalt.pdf>.
- [4] Pierson P. Increasing returns, path dependence, and the study of politics. *Am. Polit. Sci. Rev* 2000;94(2):251–67.
- [5] March JG, Olsen JP. Rediscovering Institutions. The Organizational Basis of Politics. New York: Free Press; 1989.
- [6] Tuohy CH, Glied S. The political economy of health care. In: Glied S, Smith P, editors. *The Oxford Handbook of Health Economics*. 2013. p. 58–77.
- [7] Winter S, Nielsen VL. Implementering af politik [Implementation of politics]. Århus: Academica; 2008.
- [8] Pressman JL, Wildavsky AB. Implementation: How great expectations in Washington are dashed in Oakland. Berkeley: University of California Press; 1973.
- [9] Sundheds- og Ældreministeriet [Ministry of Health and Elderly]. De danske akutmodtagelser – status 2016 [The Danish acute services – status 2016]. Copenhagen: 2016. <http://www.sum.dk/Aktuelt/Publikationer/De-danske-akutmodtagelser-maj-2016.aspx>.
- [10] Lægeforeningen [Danish Medical Association]. Uægte uddannelsesstillinger i akut medicin [Illegitimate educational positions in acute medicine]. Ugeskrift for Læger [Weekly Journal for Doctors] 22.8.2013. http://www.laeger.dk/portal/page/portal/LAEGERDK/Laegerdk/Nyheder?public_visningsType=1&public_nyhedsId=91935.
- [11] Sundhedsstyrelsen [National Board of Health]. Styrket akutberedskab – planlægningsgrundlag for det regionale sundhedsvæsen [Strengthened acute readiness – planning basis for the regional health service]. Copenhagen: 2007. <https://sundhedsstyrelsen.dk/da/udgivelser/2007/?/media/0B0FC17774D74E7FA404D272DA9C9369.ashx>.
- [12] Ministeriet for Sundhed og Forebyggelse [Ministry of Health and Prevention]. Regeringens Ekspertpanel [The Government's Expert Panel]. Regionernes investerings- og sygehusplaner [The regions' investment- and hospital plans]. Copenhagen: 2008. http://www.sum.dk/Sundhed/Sygehusvaesenet/?/media/Filer%20%20Publikationer_i.pdf/2008/screening_vurdering_nov.2008.ashx.
- [13] Pedersen KM. Er der tilstrækkeligt mange senge på de kommende akutsygehuse? [Is there a sufficient number of beds at the future acute hospitals?]. University of Southern Denmark; 2015.
- [14] Pihl M, Vilbjerg T. Bliver ministerens drøm til et mareridt? [Will the minister's dream become a nightmare?]. Jyllands-Posten 29.4.2016.
- [15] Sundhedsloven 2005 [Health Act 2005]. Retsinformation [Legal information]. Copenhagen: 2016. <https://www.retsinformation.dk/Forms/R0710.aspx?id=183932>.
- [17] Danske Regioner [Danish Regions]. Regionernes akutlægehelikopter [The regions' acute helicopter]. Copenhagen: 2016. <https://sundhedsstyrelsen.dk/da/planlaegning/specialeplanlaegning/gaeldende-specialeplan>.
- [18] Danske Regioner, Sundhedsstyrelsen, Sundheds- og Ældreministeriet [Danish Regions, National Board of Health, Ministry of Health and Elderly]. Danske akutmodtagelser – status 2016 [Danish acute facilities – status 2016]. Copenhagen: 2016. <http://www.regioner.dk/media/3084/statusrapport-om-akutmodtagelserne.pdf>.
- [19] Finansministeriet [Ministry of Finance]. Aftale om kommunernes økonomi 2017 [Agreement on the municipalities' budgets 2017]. Copenhagen: 2016. <http://www.fm.dk/nyheder/pressemeddelelser/2016/06/aftale-om-kommunernes-oekonomi-for-2017?/www.akutlaegehelikopter.dk/>.
- [20] Søgaard R, Kristensen SR, Bech M. Incentivising effort in governance of public hospitals: development of a delegation-based alternative to activity-based remuneration. *Health Policy* 2015;119(8):1076–85.
- [21] Danske Regioner [Danish regions]. Regionernes resultater 2016 [The regions' results 2016]. Copenhagen: 2016. <http://www.regioner.dk/media/3194/regionernes-resultater-2016.pdf>.
- [22] KL, Danske Regioner, Finansministeriet og Sundheds- og Ældreministeriet [Local Administration Denmark, Danish Regions, Ministry of Finance and Ministry of Health and Elderly]. Indblik i sundhedsvæsenets resultater [Insight into the results of the health care sector] Copenhagen: 2016. <http://www.sum.dk/Aktuelt/Publikationer/Indblik-i-sundhedsvaesenets-resultater-maj-2016.aspx>.
- [23] Lægeforeningen [Danish Medical association]. Kort om akutmodtagelser [Brief on acute facilities]. Copenhagen: 2015.
- [24] Sundheds- og Ældreministeriet [Ministry of Health and Elderly]. Hvad koster sundhedsvæsenet? [What are the costs of healthcare?]. Copenhagen: 2016. http://www.sum.dk/Sundhed/Sundhedsvaesenet/Sundhedsoekonomi/sundhedsvaesenet_i_tal_og_analyse/Hvad_koster_sundhedsvaesenet.aspx.
- [25] Sundhedsdatastyrelsen [Board of Health Data]. Tal og analyse [Data and analyses]. Copenhagen: 2016. <http://sundhedsdatastyrelsen.dk/da/tal-og-analyser/analyser-og-rapporter/sundhedsvaesenet/noegletal-om-sundhedsvaesenet>.
- [26] Sundhedsdatastyrelsen [National Board of Health Data]. Sengepladser og belægning. Historiske data [Beds and occupation. Historical data]. Copenhagen: 2015. <http://esundhed.dk/sundhedsaktivitet/SOB/Sider/SOB02.aspx>.
- [27] Ministeriet for Sundhed og Forebyggelse [Ministry of Health and Prevention]. Løbende offentliggørelse af produktivitet i sygehussektoren [Current publication of productivity in the hospital sector]. Copenhagen: 2015. http://www.sum.dk/Aktuelt/Nyheder/Tal_og_analyser/2015/Januar/?/media/Filer%20%20Publikationer_i.pdf/2015/Produktivitet-i-sygehusvaesenet/Produktivitet-i-sygehussektoren-tiende-delrapport.ashx.
- [28] Ministeriet for Sundhed og Forebyggelse [Ministry of Health and Prevention]. Sundhedsdata. Den nationale sundhedsprofil [Health Data. The national health profile]. Copenhagen: 2013. <http://www.sum.dk/Tal-og-analyser/?/media/>

- Filer%20-%20Publikationer_i.pdf/2013/Tal%20og%20analyser/Nationale_tal_paa_sundhed/Tal_paa_sundhed.aug.2013.4.ashx.
- [29] Dansk Sygeplejeråd [Danish Association of Nurses]. Sygeplejersker under massivt arbejdspress [Nurses under massive work pressure]. Copenhagen: 2016. <https://dsr.dk/politik-og-nyheder/nyheder/sygeplejersker-under-massivt-arbejdspress>.
- [32] Klitgaard MB, Christiansen PM. Den utænkelige reform: Strukturreformens tilblivelse 2002–2005 [The unthinkable reform. Creation of the Structural Reform 2002–2005]. Odense: Syddansk Universitetsforlag 2008.
- [33] Sundhedsdatastyrelsen [Health Data Board]. Sundhedskvalitet – Kvalitet i sundhedsvæsenet [Quality in health – Quality in the health care sector]. Copenhagen: 2016. www.sundhedskvalitet.dk.
- [34] Sundhedsstyrelsen og Danske Regioner [National Board of Health and Danish Regions]. Faglig gennemgang af akutmodtagelserne [Professional review of the acute care facilities]. Copenhagen: 2014. https://www.google.dk/?gws_rd=cr,ssl&ei=Cwt-V63glqPL6ASTIIKIaw#q=Faglig+gennemgang+af+akutmodtagelserne+&spf=1498566233206.
- [35] OECD Reviews of Health Care Quality: Denmark 2013. Rising standards. Paris: 2013. http://www.oecd-ilibrary.org/social-issues-migration-health/oecd-reviews-of-health-care-quality-denmark-2013_9789264191136-en.
- [36] Regeringen, Danske Regioner [The Government, Danish Regions]. Aftale om regionernes økonomi for 2018 [Agreement on the regions' finances for 2018]. Copenhagen: 2017. http://www.denoffentlige.dk/sites/default/files/suppliers/news/files/aftale_om_regionernes_oekonomi_for_2018.pdf.
- [37] Kommunernes Landsforening [Local Government Denmark]. Så langt får borgeren til nærmeste akutsygehus [Citizens' distance to nearest acute hospital]. Copenhagen: 2015. <http://www.kl.dk/Menu-fallback/Sa-langt-far-borgeren-til-naermeste-akutsygehus-id178665/>.
- [38] Sundhedsstyrelsen [National Board of Health]. Gældende specialeplan 2017.06.14 [Actual plan for specialties]. Copenhagen: 2017. <https://www.sst.dk/da/planlaegning/specialeplanlaegning/gaeldende-specialeplan>.
- [39] Danmarks Statistik [Statistics Denmark]. Dødsfald og middellevetid [Mortality and life expectancy]. Copenhagen: 2017. <http://www.dst.dk/da/Statistik/emner/befolkning-og-valg/doedsfald-og-middellevetid>.
- [40] Sundheds- og Ældreministeriet [Ministry of Health and Elderly]. Sundhedsvæsenet i tal og fakta [The health sector by numbers and facts]. Copenhagen: 2017. http://www.sum.dk/Sundhed/Sundhedsvaesnet/Sundhedsoekonomi/Sundhedsvaesnet_i_tal_og_fakta.aspx.
- [41] Indenrigsministeriet [Ministry of Interior]. Strukturkommissionens betænkning. Sammenfatning [White paper by the Structural Commission. Overview]. Copenhagen: 2004.
- [42] Økonomi- og Indenrigsministeriet [Ministry of Economics and Interior]. Evaluering af kommunalreformen [Evaluation of the Local Government Reform]. Copenhagen: 2013. <http://sim.dk/media/15185/evaluering-af-kommunalreformen.pdf>.
- [43] IKAS [The Danish Institute for Quality and Accreditation in Healthcare]. Den danske kvalitetsmodel [The Danish Quality Model]. <http://www.ikas.dk/den-danske-kvalitetsmodel/>.
- [44] Danske Regioner [Danish Regions]. Danske Regioners Kliniske Kvalitetsudviklingsprogram [Danish regions' Program for Clinical Quality development]. Copenhagen: <http://www.rkkp.dk/>.
- [45] Enhed for Evaluering og Brugerinddragelse 2017. [Unit for Evaluation and Patient Involvement 2017]. Den Landsdækkende Undersøgelse af Patientoplevelser (LUP) [The nationwide survey of patient experiences (LUP)]. Copenhagen: 2017. <http://patientoplevelser.dk/lup/landsdaekkende-undersoegelse-patientoplevelser-lup>.
- [46] Danske Regioner [Danish Regions]. Borgernes sundhedsvæsen – vores sundhedsvæsen [Citizens' healthcare – our healthcare]. Copenhagen: 2016. <http://www.regioner.dk/media/1269/plan-bs.pdf>.
- [47] Ministeriet for Sundhed og Forebyggelse [Ministry of Health and Prevention]. Nationalt kvalitetsprogram for sundhedsområdet 2015–2018 [National Quality Programme in Health 2015–2018]. Copenhagen: 2015. http://sum.dk/?/media/Filer%20-%20Publikationer_i.pdf/2015/Nationalt-kvalitetsprogram-for-sundhedsomraadet/Nationalt%20kvalitetsprogram%20for%20sundhedsomr%C3%A5det%20-%20april%202015.ashx.
- [48] e-sundhed.dk [e-health.dk]. <http://www.esundhed.dk/sundhedskvalitet/Sider/sundhedskvalitet.aspx>.
- [50] Regeringen, KL, Danske Regioner [The Government, Local Government Denmark, Danish Regions]. Digitalisering med effekt. National Strategi for digitalisering af sundhedsvæsenet 2013–2017 [Digitization with effect. National Strategy for Digitization of the Healthcare Sector 2013–2017]. Copenhagen: 2013. <http://sundhedsdatastyrelsen.dk/da/rammer-og-tetningslinjer/om-digitaliseringsstrategi>.
- [51] Grosen L. Electronic Health Records in Denmark. Health Policy monitor; 2009. p. 2009 <http://hpm.org/survey/dk/a14/5>.
- [52] Sundhedsdatastyrelsen [Health Data Board]. Medicinkort [Medication Card]. <https://www.sundhed.dk/borger/min-side/min-sundhedsjournal/medicinkort/>.
- [53] Rigsrevisionens [National Audit Office]. Elektroniske patientjournaler på sygehuse [Electronic patient records at hospitals]. Copenhagen: 2017. <http://rigsrevisionen.dk/media/2104507/402-17.pdf>.
- [54] Sundhedsdatastyrelsen [National Board of Health]. Vejledning om informationssikkerhed i sundhedsvæsenet [Instruction on Information Security in the Healthcare Sector]. Copenhagen: 2016.
- [55] Sundhedsstyrelsen [National Board of Health]. Gældende specialeplan 2017 [Specialty Plan 2017]. Copenhagen: 2017. <https://www.sst.dk/da/planlaegning/specialeplanlaegning/gaeldende-specialeplan>.
- [56] Sundheds- og Ældreministeriet [Ministry of Health and Elderly]. Løbende offentliggørelse af produktivitet i sygehussektoren (XII delrapport) [Ongoing publication of productivity in the hospital sector. (Report XII)]. Copenhagen: 2017. <http://www.sum.dk/Aktuelt/Publikationer/Produktivitet-udvikling-2014-2015-dec-2016.aspx>.
- [57] Sundhedsstyrelsen [National Board of Health]. Opfølgning på specialeplan [Follow-up on the specialty plan]. Copenhagen: 2017. <https://www.sst.dk/da/planlaegning/specialeplanlaegning/opfoelgning-paa-specialeplan>.